

What is claimed is:

1. A polarizing beam splitter comprising:

(a) a birefringent film comprising a plurality of first material layers and a plurality of second material layers, wherein the first material layers comprise a polymer selected from a group consisting of polyethylene terephthalate and copolymers of polyethylene terephthalate and polyethylene naphthalate and the second material layers comprise a copolyester comprising, as comonomer subunits, 1,4-terephthalate, 1,2-ethane diol, 1,4-cyclohexane dicarboxylate, and 1,4-cyclohexane dimethanol; and

(b) at least one prism comprising a base adjacent a first major surface of the birefringent film, wherein the at least one prism comprises a refractive index greater than 1.6.

2. The polarizing beam splitter of claim 1, wherein copolyester of the second material layers comprises, as comonomer subunits, about 5 to 45 mol% 1,4-terephthalate, about 5 to 45 mol% 1,2-ethane diol, about 5 to 45 mol% 1,4-cyclohexane dicarboxylate, and about 5 to 45 mol% 1,4-cyclohexane dimethanol;

3. The polarizing beam splitter of claim 1, wherein the first material layers comprise a copolymer of polyethylene terephthalate and polyethylene naphthalate that contains less than 50 mol% polyethylene naphthalate, based on the total amount of first material.

4. The polarizing beam splitter of claim 1, wherein the first material layers comprise polyethylene terephthalate.

5. The polarizing beam splitter of claim 1, wherein the copolyester of the second material layers further comprises, as comonomer subunits, neopentyl glycol.

6. The polarizing beam splitter of claim 1, wherein the copolyester of the second material layers further comprises, as comonomer subunits, trimethylol propane.

7. The polarizing beam splitter of claim 1, wherein the copolyester of the second material layers further comprises, as comonomer subunits, 2-butyl 2-ethyl 1,3-propanediol.

8. The polarizing beam splitter of claim 1, wherein the copolyester of the second material
5 layers further comprises, as comonomer subunits, neopentyl glycol and trimethylol propane.

9. The polarizing beam splitter of claim 1, wherein the copolyester of the second material layers further comprises, as comonomer subunits, trimethylol propane and 2-butyl 2-ethyl 1,3-propanediol.

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10. The polarizing beam splitter of claim 1, wherein the at least one prism comprises a first right angle prism and a second right angle prism, wherein the first right angle prism and the second right angle prism are positioned so as to form substantially a cube and the birefringent film is disposed between the two prisms so as to lie along the diagonal of the cube.

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11. The polarizing beam splitter of claim 1 having a contrast ratio greater than about 300 to 1.

12. The polarizing beam splitter of claim 1 having a contrast ratio greater than 1000 to 1.

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13. A multi-layer film comprising a plurality of first material layers and a plurality of second material layers, wherein the first material layers comprise a polymer selected from a group consisting of polyethylene terephthalate and copolymers of polyethylene terephthalate and polyethylene naphthalate and the second material layers comprise a copolyester
25 comprising, as comonomer subunits, 1,4-terephthalate, 1,2-ethane diol, 1,4-cyclohexane dicarboxylate, and 1,4-cyclohexane dimethanol.

14. The multi-layer film of claim 13, wherein copolyester of the second material layers comprises, as comonomer subunits, about 5 to 45 mol% 1,4-terephthalate, about 5 to 45 mol%

1,2-ethane diol, about 5 to 45 mol% 1,4-cyclohexane dicarboxylate, and about 5 to 45 mol% 1,4-cyclohexane dimethanol;

15. The multi-layer film of claim 13, wherein the first material layers comprise a
5 copolymer of polyethylene terephthalate and polyethylene naphthalate that contains less than 50 mol% polyethylene naphthalate, based on the total amount of first material.

16. The multi-layer film of claim 13, wherein the first material layers comprise polyethylene terephthalate.

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17. The multi-layer film of claim 13, wherein the copolyester of the second material layers further comprises, as comonomer subunits, neopentyl glycol.

18. The multi-layer film of claim 13, wherein the copolyester of the second material layers
15 further comprises, as comonomer subunits, trimethylol propane.

19. The multi-layer film of claim 13, wherein the copolyester of the second material layers further comprises, as comonomer subunits, 2-butyl 2-ethyl 1,3-propanediol.

20. The multi-layer film of claim 13, wherein the copolyester of the second material layers
20 further comprises, as comonomer subunits, neopentyl glycol and trimethylol propane.

21. The multi-layer film of claim 13, wherein the copolyester of the second material layers
25 further comprises, as comonomer subunits, trimethylol propane and 2-butyl 2-ethyl 1,3-propanediol.

22. An optical device, comprising:

(a) the polarizing beam splitter of claim 1, a first path being defined through the polarizing beam splitter for light in a first polarization state; and

(b) at least one imager disposed to reflect light back to the polarizing beam splitter, portions of light received by the at least one imager being polarization rotated, polarization rotated light propagating along a second path from the imager and through the polarizing beam splitter.

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23. A projection system, comprising:

- (a) a light source to generate light;
- (b) conditioning optics to condition the light from the light source;
- (c) an imaging core to impose on image on conditioned light from the

10 conditioning optics to form image light, the imaging core including the polarizing beam splitter of claim 1 and at least one imager; and

- (d) a projection lens system to project the image light from the imaging core.

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